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Report on the technical review of the seventh national communication of Estonia

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Estonia, conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

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Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
BR	biennial report
CDM	clean development mechanism
CH_4	methane
CHP	combined heat and power
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
EEDP 2030+	Estonian Energy Development Plan until 2030
ERT	expert review team
ESD	effort-sharing decision
ESTEA	Estonian Environment Agency
EU	European Union
EU ETS	European Union Emissions Trading System
GDP	gross domestic product
GHG	greenhouse gas
GPCP 2050	General Principles of Climate Policy until 2050
HFC	hydrofluorocarbon
IE	included elsewhere
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
KP2	second commitment period of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2"
RES	renewable energy sources
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on NCs	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications"
WAM	'with additional measures'
WEM	'with measures'

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the NC7 of Estonia. The review was coordinated by the secretariat in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention", particularly "Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention" (annex to decision 13/CP.20), and the "Guidelines for review under Article 8 of the Kyoto Protocol" (annex to decision 22/CMP.1 and annex I to decision 4/CMP.11).[1]

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Estonia, which provided comments that were considered and incorporated, as appropriate into this final version of the report.

3. The review was conducted from 12 to 17 March 2018 in Bonn, Germany by the following team of nominated experts from the UNFCCC roster of experts: Ms. Asia Adlan (Sudan), Mr. Menouer Boughedaoui (Algeria), Mr. Christo Christov (Bulgaria), Ms. Nancy Liliana Gamba Cabezas (Colombia), Mr. Domenico Gaudioso (Italy), Mr. Liviu Gheorghe (Romania), Mr. Dirk Günther (Germany), Ms. Fui Pin Koh (Malaysia), Ms. Sangchan Limjirakan (Thailand), Mr. Juan Luis Martin Ortega (Spain), Mr. Engin Mert (Turkey), Ms. Gherghita Nicodim (Romania), Mr. Koki Okawa (Japan), Ms. Marcela Itzel Olguin-Alvarez (Mexico), Mr. Brian Quirke (Ireland), Ms. Kristina Saarinen (Finland), Ms. Marina Shvangiradze (Georgia) and Ms. Caroline Tagwireyi (Zimbabwe). Mr. Gaudioso, Ms. Saarinen and Ms. Shvangiradze were the lead reviewers. The review was coordinated by Ms. Veronica Colerio, Ms. Suvi Monni and Ms. Sevdalina Todorova (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Estonia in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

1. Timeliness

5. The NC7 was submitted on 30 December 2017, before the deadline of 1 January 2018 mandated by decision 9/CP.16. An updated version of the NC7 was submitted on 9 March 2018.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Estonia in its NC7, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

[1] At the time of the publication of this report, the Party had submitted its instrument of acceptance of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Table 1

Assessment of completeness and transparency of mandatory information reported by Estonia in its seventh national communication, including supplementary information under the Kyoto Protocol

Section of NC	*Completeness*	*Transparency*	*Reference to description of recommendations*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to description of recommendations*
Executive summary	Complete	Transparent		National system	Complete	Transparent	
National circumstances	Complete	Transparent		National registry	Complete	Transparent	
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
PaMs	Complete	Transparent		PaMs in accordance with Article 2	Complete	Mostly transparent	Issue 4 in table 7
Projections and the total effect of PaMs	Mostly complete	Transparent	Issue 3 in table 11 Issues 1 and 2 in table 13	Domestic and regional programmes and/or arrangements and procedures	Mostly complete	Transparent	Issue 1 in table 5
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10[a]	NA	NA	NA
Financial resources and transfer of technology[b]	NA	NA	NA	Financial resources[c]	NA	NA	NA
Research and systematic observation	Complete	Transparent		Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

[a] The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

[b] Estonia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

[c] Estonia is not an Annex II Party and is therefore not obliged to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2017 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2
Overview of supplementary information under the Kyoto Protocol reported by Estonia

Supplementary information	*Reference to section of NC7*
National registry	3.4
National system	3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	5.4
PaMs in accordance with Article 2	4.2 and 4.3
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	4.2
Information under Article 10	3.3, 4.2, 6.5.1, 8.2.6, 7.2, 8 and 9.8
Financial resources[a]	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	4.3.11 Reported in the NIR of the Party's 2017 annual submission

[a] Reporting on financial resources under the Kyoto Protocol is relevant to Annex II Parties. As Estonia is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

A. Information on national circumstances and greenhouse gas emissions and removals

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

8. The national circumstances of Estonia explain the relationship between its historic and future emission trends and the climate change policy agenda. The changing nature of those circumstances defines the factors that affect the climate policy development and implementation of the Convention. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, and economic developments and covers energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater.

9. Given the limited domestic market, the economy of Estonia is based largely on the export of products and services (90 per cent of GDP). The growth of Estonia's GDP in the last 20 years exceeds 50 per cent. It has decelerated in recent years (GDP growth was 1.4 per cent in 2015) owing to weak foreign demand and is expected to stabilize at around 3 per cent in the coming years. The structure of the economy changed at the beginning of 1990s, which resulted in a decreasing emission trend, but emission levels have remained stable over the last decade at the level of approximately 20,000 kt CO_2 eq. Energy and agriculture

are the largest contributors to the country's GHG emissions, with shares of 87.9 and 7.4 per cent, respectively, in 2015.

10. Estonia is among the EU countries least dependent on energy imports, thanks to its use of oil shale and increasing use of renewable fuels. Estonia ranks among the top EU member States in terms of primary energy production per capita and is a net energy exporter. In 2015 the production of electricity in Estonia totalled 10,400 GWh and 15.6 per cent of that came from RES. In the transport sector, the number of passengers travelling by train and the use of road transport have been growing in recent years, whereas a steady decline has been observed in freight transport, with the lowest activity level of the last 15 years reached in 2016. The volume of the industrial sector has increased by approximately 38 per cent since 2010 and has almost doubled in current prices since 2005.

11. As regards the agriculture sector, the area of agricultural land in Estonia dropped from 1,458,400 ha in 1990 to 995,000 ha in 2016 and the number of farm animals has fallen by 69 per cent, owing mainly to the structural changes in the economy since the 1990s. However, the area of agricultural land has increased by 88,000 ha in the past 10 years, since Estonia joined the EU and has received support under the EU Common Agricultural Policy Implementation Act to develop agriculture and the food industry. Forest area (51 per cent of the total land area) has gradually increased in Estonia since the 1950s owing to afforestation of former grasslands and wetlands, in particular in the 1960s and 1970s, and to the decrease in agricultural activity since the 1990s.

12. About 24.7 million t waste was generated in 2015 (of which 0.3 million t was municipal solid waste) and over the last decade waste generation has steadily increased, excluding some years of a downward trend owing to the economic crisis. Thanks to mechanical and biological waste treatment and the operation of the Iru waste incineration plant, the amount of municipal solid waste disposed to landfill has decreased steadily (7 per cent of generated municipal waste in 2015).

13. The ERT noted that, during the period 1990–2015, Estonia's population decreased by 16.2 per cent and GDP increased by 54.8 per cent, whereas GHG emissions (without LULUCF) per GDP unit and GHG emissions per capita decreased by 71.2 and 46.7 per cent, respectively. The ERT noted a significant decoupling of total GHG emissions from economic growth. Table 3 illustrates the national circumstances of Estonia by providing some indicators relevant to emissions and removals.

Table 3
Indicators relevant to greenhouse gas emissions and removals for Estonia for the period 1990–2015

						Change (%)	
Indicator	*1990*	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*
GDP per capita (thousands 2010 USD using purchasing power parity)	14.07	14.93	21.62	25.64	25.98	84.7	1.4
GHG emissions without LULUCF per capita (t CO_2 eq)	25.75	12.39	15.88	16.04	13.71	–46.7	–14.5
GHG emissions without LULUCF per GDP unit (kg CO_2 eq per 2010 USD using purchasing power parity)	1.83	0.83	0.73	0.63	0.53	–71.2	–15.6

Sources: (1) GHG emission data: Estonia's 2017 GHG inventory submission, version 3; (2) population and GDP: World Bank.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

(b) Assessment of adherence to the reporting guidelines

14. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. There were no issues raised during the review relating to the topics discussed in this chapter of the review report.

2. Information on greenhouse gas inventory arrangements, emissions, removals and trends

(a) Technical assessment of the reported information

15. Total GHG emissions[2] excluding emissions and removals from LULUCF decreased by 55.3 per cent between 1990 and 2015, while total GHG emissions including net emissions or removals from LULUCF decreased by 59.4 per cent over the same period. Table 4 illustrates the emission trends by sector and by gas for Estonia.

Table 4
Greenhouse gas emissions by sector and by gas for Estonia for the period 1990–2015

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Sector									
1. Energy	36 397.39	14 974.85	18 939.30	18 691.23	15 863.86	–56.4	–15.1	90.1	87.9
A1. Energy industries	29 281.48	12 144.17	15 432.26	14 936.02	12 237.23	–58.2	–18.1	72.5	67.8
A2. Manufacturing industries and construction	2 506.62	580.39	512.80	706.01	497.63	–80.1	–29.5	6.2	2.8
A3. Transport	2 477.19	1 682.11	2 261.03	2 264.43	2 323.82	–6.2	2.6	6.1	12.9
A4. and A5. Other	2 081.83	540.95	710.10	767.30	789.65	–62.1	2.9	5.2	4.4
B. Fugitive emissions from fuels	50.27	27.23	23.11	17.47	15.53	–69.1	–11.1	0.1	0.1
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	965.73	697.60	537.58	707.69	512.92	–46.9	–27.5	2.4	2.8
3. Agriculture	2 669.72	1 078.02	1 192.37	1 341.93	1 337.62	–49.9	–0.3	6.6	7.4
4. LULUCF	–1 734.71	–3 396.68	–1 924.39	–1 754.94	–2 359.23	36.0	34.4	NA	NA
5. Waste	369.90	562.80	474.20	340.27	326.08	–11.8	–4.2	0.9	1.8
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Indirect CO_2[a]	IE	IE	IE	IE	IE	NA	NA	NA	NA
Gas[b]									
CO_2	37 069.22	15 362.56	19 015.14	18 910.21	15 885.37	–57.1	–16.0	91.7	88.1
CH_4	1 909.61	1 238.80	1 196.23	1 106.43	1 059.09	–44.5	–4.3	4.7	5.9
N_2O	1 423.92	630.15	754.82	844.86	870.96	–38.8	3.1	3.5	4.8
HFCs	NO	79.15	175.54	217.52	222.82	NA	2.4	0.0	1.2
PFCs	NO	NO	NO	NO	NO	NA	NA	NA	NA
SF_6	NO	2.61	1.73	2.10	2.25	NA	7.2	0.0	0.0
NF_3	NO	NO	NO	NO	NO	NA	NA	NA	NA
Total GHG emissions without LULUCF	**40 402.74**	**17 313.27**	**21 143.45**	**21 081.13**	**18 040.48**	**–55.3**	**–14.4**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**38 668.03**	**13 916.58**	**19 219.06**	**19 326.18**	**15 681.26**	**–59.4**	**–18.9**	**NA**	**NA**

Source: GHG emission data: Estonia's 2017 annual submission, version 3.

[a] Indirect CO_2 emissions from non-methane volatile organic compounds from solvent use and road paving with asphalt are reported under subcategory 2.D.3 other and therefore are already included under the IPPU sector.

[b] Emissions by gas without LULUCF and without indirect CO_2, whenever reported separately.

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph were calculated on the basis of the 2017 annual submission, version 3.

16. The decrease in total emissions was driven mainly by the restructuring of the economy due to the transition from a centrally planned economy to a market economy and the successful implementation of the necessary reforms. Between 1990 and 2000, the decrease in GHG emissions is related to major structural changes in the economy after Estonia gained its independence from the former Soviet Union, while after 2000, fluctuations in emissions are due mainly to economic trends, changes in the energy supply structure and electricity production level and weather conditions.

17. Between 1990 and 2015, GHG emissions from the energy sector decreased by 56.4 per cent (20,533.53 kt CO_2 eq), owing mainly to the structural changes in the economy after 1991. Those changes were coupled with a drastic decrease in the consumption of fuels and energy in energy industries, the closure of factories, the penetration of new and environmentally friendly cars, energy saving in the residential and households sector, etc. The trend in GHG emissions from fuel combustion showed notable decreases in energy industries (58.2 per cent or 17,044.25 kt CO_2 eq) and in manufacturing industries and construction (80.1 per cent or 2,008.99 kt CO_2 eq) and a less notable decrease in transport (6.2 per cent or 153.37 kt CO_2 eq). The decreasing emission trend reflects also the changes in the fuel mix on the supply side, namely the decreased consumption of peat, oil shale, shale oil and fuel oil and the increasing trend in renewable energy production (28.6 per cent share of RES in final energy consumption in 2015).

18. Between 1990 and 2015, GHG emissions from IPPU decreased by 46.9 per cent (452.81 kt CO_2 eq), owing mainly to the restructuring of the sector during the transition from a centrally planned economy to a market economy and to less extensive industrial production. Emissions have dropped since 1990, reaching their lowest level in 1993 (355.35 kt CO_2 eq). The fluctuations in emissions in the following years were caused mainly by the reduction in ammonia production, the increase in cement production and an economic slowdown in 2009 and 2015. Between 1990 and 2015, GHG emissions from the agriculture sector decreased by 49.9 per cent (1,332.10 kt CO_2 eq), owing mainly to the loss of the markets of the former Soviet Union in the early 1990s, which led to a rapid decline in the animal population and crop production. The LULUCF sector was a net sink of 2,359.23 kt CO_2 eq in Estonia in 2015; net GHG removals have increased by 624.52 kt CO_2 eq since 1990. That trend was driven mainly by the decrease in harvest and harvested wood products. The majority of the CO_2 removals originate from the biomass increment in forest land and land converted to forest. Between 1990 and 2015, GHG emissions from the waste sector decreased by 11.8 per cent (43.82 kt CO_2 eq), owing mainly to the reduction in solid waste disposal and improved wastewater treatment.

19. The main GHG in Estonia in 2015 was CO_2, accounting for 88.1 per cent, followed by CH_4 with 5.9 per cent, N_2O with 4.8 per cent and the fluorinated gases collectively with 1.2 per cent of the total GHG emissions (without LULUCF) expressed in CO_2 eq. Emissions of CO_2 (with indirect CO_2 emissions) decreased by 57.1 per cent from 37,069.22 kt in 1990 to 15,885.37 kt in 2015 owing to the reduction in emissions from the subsector public electricity and heat production, which is a major source of CO_2 emissions in Estonia. Emissions of CH_4 decreased by 44.5 per cent from 1,909.61 kt CO_2 eq in 1990 to 1,059.09 kt CO_2 eq in 2015, which was especially noticeable in the agriculture subsector enteric fermentation, a major source of CH_4 emissions in Estonia. Emissions of N_2O decreased by 38.8 per cent from 1,423.92 kt CO_2 eq in 1990 to 870.96 kt CO_2 eq in 2015, owing mainly to the reduction in emissions from agricultural soils. Emissions of fluorinated gases (HFCs, PFCs and SF_6) increased from 0 kt CO_2 eq in 1990 to 225.07 kt CO_2 eq in 2015 owing to the increase in the use of HFCs as substitutes for ozone-depleting substances in refrigeration and air conditioning.

20. The summary information provided on GHG emissions was consistent with the information reported in the 2017 annual inventory submission. However, the ERT noted that, while the Party reported indirect emissions in the textual parts of the NC7 and in NC tables 1.1, 3.1 and 3.2, they were not included separately in the annexes to the NC7 (CRF Summary 1.A, Summary 2 and table 10). In addition, the ERT also noted that the national totals reported in the NC7 always include indirect emissions. The ERT took note of the

review of this issue in the report on the individual review of the 2016 annual submission of Estonia,[3] particularly of issues G.5 and I.11 in table 5 of the report.

(b) Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

22. Estonia provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC7 also contains a reference to the description of the national system provided in the NIR of the 2017 annual submission. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2016 annual submission of Estonia.

(b) Assessment of adherence to the reporting guidelines

23. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

24. In the NC7 Estonia provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2016 annual submission of Estonia.

(b) Assessment of adherence to the reporting guidelines

25. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Information on policies and measures and institutional arrangements

1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

26. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Estonia committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level. The majority of Estonia's strategies are anchored in or linked to the EU policy and the EU 2020 climate and energy package. The national targets within the framework of the EU joint commitment are included in the National

[3] FCCC/ARR/2016/EST.

Reform Programme Estonia 2020, approved by the Government in April 2011 and updated yearly (last updated in April 2017). The programme has three main targets regarding GHG emissions and environmental economy and energy: (1) emissions from non-ETS sectors should not exceed the level of 11 per cent growth by 2020 compared with 2005; (2) the share of renewable energy in final energy consumption should reach 25 per cent by 2020; and (3) final energy consumption should be kept at the 2010 level (about 118 PJ).

27. Several other strategies and programmes address Estonia's climate policy. Estonian low-carbon strategy GPCP 2050 is a vision document that sets a long-term GHG emission reduction target and policy guidelines for adapting to the impacts of climate change and/or ensuring the preparedness and resilience to react to the impacts of climate change. The Estonian National Strategy on Sustainable Development – Sustainable Estonia 21 – is the key overarching national document on development in line with the principles of sustainable development. The Government's Action Plan for 2016–2019 sets as goals for 2019: 48 per cent reuse of the total mass of municipal solid waste; a balance between felling of timber and yearly regrowth of wood; and a 27 per cent share of renewables in final energy consumption (17 per cent in final consumption of electricity and 53 per cent in heat generation in district heating systems). The main objective of the Climate Change Adaptation Development Plan until 2030 (adopted on 2 March 2017) is to increase readiness and capacity at the country, regional and local level to adapt to the effects of climate change.

28. The overall responsibility for climate change policymaking in Estonia lies with the Ministry of the Environment, and a number of national institutions are involved in the implementation of the policy, in particular the Ministry of Economic Affairs and Communications, the Ministry of Rural Affairs and the Ministry of Finance. The monitoring and regular evaluation of PaMs adopted is usually performed by the institution that is implementing the relevant strategy document or action plan. PaMs and their effects are evaluated and verified on a biennial basis in line with EU requirements (regulation 525/2013). The Coordination Council of EU Issues, which comprises representatives of all ministries and the Bank of Estonia and is chaired by the Estonian Director for EU Affairs, ensures effective interministerial cooperation.

29. Estonia has legislative arrangements and administrative procedures in place to make information publicly accessible in line with its Public Information Act. Regarding climate change, strategy documents and action plans are generally available on the websites of the responsible ministries, which are also liable for the implementation procedures.

30. Estonia has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. Since 2009 Estonia has been making efforts to monitor, estimate and report carbon flows related to afforestation, reforestation and deforestation activities (under Article 3, paragraph 3, of the Kyoto Protocol) through the National Forest Inventory, which reports land-use changes. For the second commitment period of the Kyoto Protocol, Estonia has decided not to elect any activities under Article 3, paragraph 4, of the Kyoto Protocol (besides the mandatory activity of forest management).

(b) Assessment of adherence to the reporting guidelines

31. The ERT assessed the information reported in the NC7 of Estonia and identified an issue relating to completeness. The finding is described in table 5.

Table 5
Finding on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol from the review of the seventh national communication of Estonia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 38 Issue type: completeness Assessment: recommendation	The NC7 does not provide a description of any national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, also contributes to the conservation of biodiversity and sustainable use of natural resources. In response to a question raised by the ERT, Estonia reported that activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol follow sustainable forest management principles, that is, management of forests in a way that ensures their current and potential biological diversity, productivity, capability for regeneration and vitality and enables all functions also to be performed in the future without causing harm to other ecosystems. The principles are set out in the Estonian Forestry Development Programme until 2020 and the Estonian low-carbon strategy GPCP 2050. The ERT recommends that Estonia improve the completeness of its reporting by including in its next submission the information provided during the review concerning any national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, also contributes to the conservation of biodiversity and sustainable use of natural resources.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

(a) Technical assessment of the reported information

32. Estonia provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The Party reported on its policy context and legal and institutional arrangements put in place to implement its commitments.

33. Estonia provided information on a set of PaMs similar to those previously reported. The Party indicated (in section 4.2 of the NC7) that there had been no significant changes made since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target. In the NC6 Estonia explained how PaMs and progress made are evaluated. The ERT noted that the NC7 lacks such information. During the review Estonia explained that, according to established practice, the relevant ministries analyse annually national development plans and/or the implementation reports under their area of administration to see if the country is on track with an activity and/or emission reduction target and, if not, what needs to be done. Under GPCP 2050 the climate policy will be reviewed and, if necessary, updated every four years, and the main principles of the climate policy will be taken into consideration in preparing and implementing cross-sectoral and sectoral strategies.

34. Estonia gave priority to implementing the PaMs that make the most significant contribution to its emission reduction efforts. The Party provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention (in section 4.3.10 of the NC7). For example, the programme for the wider utilization of RES sets a goal of a 20 per cent share of RES in final energy consumption by 2020, while the continuously increasing share of RES in final energy consumption had already reached 28.6 per cent in 2015. Estonia reported on how it periodically updates its PaMs to reduce greater levels of emissions and

on the PaMs that have been discontinued since the previous submission. The NC7 indicates that new versions of measures usually replace the existing measures when their target dates are reached.

35. All listed PaMs are implemented at the national level, such as supporting the use of renewable energy in electricity production with feed-in tariffs, decreasing emissions from transport by increasing the share of biofuel use and reducing energy losses from district heating systems by renovating them.

36. Under the Convention Estonia committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020. The EU offered to move to a 30 per cent reduction target on the condition that other developed countries commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

37. The key overarching cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO_2 emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

38. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N_2O emissions from chemical industries, PFC emissions from aluminium production and CO_2 emissions from industrial processes (since 2013).

39. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 20 per cent below the 1990 level by 2020 and it includes binding annual targets for each member State for 2013–2020. Under the ESD, Estonia has a target of limiting its emission growth to 11 per cent above the 2005 level by 2020 for the non-ETS sectors.

40. Estonia introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key cross-sectoral policies reported are the National Reform Programme Estonia 2020 and GPCP 2050 (see paras. 26–27 above), the National Renewable Energy Action Plan, with renewable energy goals for up until 2020, the National Energy Efficiency Programme and the Estonian Rural Development Plan 2014–2020. The key measures reported are in the energy sector and include supporting the use of RES and efficient CHP-based electricity production and improving the efficiency of the use of oil shale. The mitigation effect of supporting renewable and efficient CHP-based electricity production is the most significant of the measures, with estimated mitigation impacts of 1,309.86, 1,554.50, 1,570.58 and 1,729.97 kt CO_2 eq for 2020, 2025, 2030 and 2035, respectively. The key policies in the transport sector are supporting the use of biofuels and promoting public transport, energy-efficient cars, hybrid buses, hybrid trolleys, electrical buses and non-motorized transport; changing public behaviour; and managing or reducing fuel demand. The mitigation effect of increasing the share of biofuel use is the most significant in the transport sector, with 251.80, 294.30, 329.60 and 319.60 kt CO_2 eq estimated emission reductions by 2020, 2025, 2030 and 2035, respectively. Other policies that have delivered significant emission reductions are renovating district heating systems, improving the traffic system by updating the lighting system, updating parking policies and restructuring city streets.

41. Estonia highlighted the domestic mitigation actions that are under development, such as additional renovation of heat networks for reducing losses (with mitigation

potentials of 168.90, 198.10, 365.00 and 440.60 kt CO_2 eq by 2020, 2025, 2030 and 2035, respectively) and introducing road usage fees for cars and heavy-duty vehicles based on mileage, location and environmental performance (with the potential to reduce emissions by 69.9, 194.5, 324.3 and 360.7 kt CO_2 eq by 2020, 2025, 2030 and 2035, respectively).

42. Table 6 provides a summary of the reported information on the PaMs of Estonia.

Table 6
Summary of information on policies and measures reported by Estonia

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	GPCP 2050	NE	NE
	National Reform Programme Estonia 2020	NE	NE
	National Renewable Energy Action Plan	NE	NE
Energy	EEDP 2030+	NE	NE
	Improvement of the efficiency of the use of oil shale	881.40	155.50
Transport	Increase of the use of biofuels in transport	251.80	329.60
	Road usage fees for cars and heavy-duty vehicles	69.90	324.30
Renewable energy	Support for renewable and efficient CHP-based electricity production	1 309.86	1 570.58
	Investment support for wind parks	66.00	66.00
Energy efficiency	Additional renovation of heat networks	168.90	365.00
	Renovation of boiler houses	65.20	140.60
	Renovation of heat networks	48.20	104.20
IPPU	EU regulation 517/2014 on reducing emissions and replacing fluorinated gases by other substances	22.82	108.80
Agriculture	Introduction of effective fertilization technologies	NE	NE
	Reduction of pollution caused by nutrients from agriculture	NE	NE
LULUCF	Improvement of forest economic and ecological vitality	NE	NE
	Natura 2000 support for private forest land	NE	NE
	Support for growing plants of local varieties	NE	NE
Waste	Limit on percentage of biodegradable waste deposited	11.97	50.63
	Increase of reuse and recycling of waste materials	NE	NE

Note: The estimates of mitigation impact are estimates of emissions of CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions.

43. The ERT noted that most of the reported measures have already been implemented and some of their impacts are already quantifiable; examples of implementation costs and mitigation results were provided in the NC7.

(b) Policies and measures in the energy sector

44. The energy sector is the main source of GHG emissions in Estonia, with a share of 87.9 per cent of the country's total emissions in 2015. Stationary combustion contributes 85.3 per cent of the emissions from the sector and therefore represents the biggest mitigation potential.

45. **Energy supply**. The National Development Plan for the Energy Sector until 2020 from 2009 envisages steady, efficient, environmentally benign energy supply at reasonable prices while ensuring the sustainable use of energy in Estonia. On 19 October 2017 Estonia approved EEDP 2030+ with the aim of ensuring energy supply while taking into account the long-term energy and climate policy of the EU. The expected outcomes of the plan are that GHG emissions are reduced by 70 per cent in the energy sector, the share of renewable energy increased to 50 per cent of final energy consumption and 28 per cent of domestic primary energy consumption, and final energy consumption in 2020 and 2030 kept at the 2010 level.

46. In Estonia, oil shale is the main domestic fuel and oil shale firing power plants produce more than 80 per cent of the electricity in the country. Its long-term balanced use was established with the adoption in March 2016 of the National Development Plan for the Use of Oil Shale 2016–2030, which includes an assessment of the use of shale fuel oil and oil shale gas taking into account economic, social, security and environmental issues.

47. The National Development Plan for the Electricity Sector until 2018 from 2009 forecasts a significant decrease in electricity production from oil shale and an increase in the proportion from other sources of energy. The plan provides scenarios for restructuring electricity production in Estonia and states that the capacity of wind turbines (mainly wind farms) could be increased significantly (up to 900 MW).

48. **Renewable energy sources**. The data presented in the NC7 demonstrate that the share of RES in the fuel mix in Estonia is continuously increasing. As an EU member State, Estonia has a renewables target for 2020 under EU legislation (directive 2009/28/EC) of a 25 per cent share of RES in total energy consumption by 2020. In 2010 Estonia approved the National Renewable Energy Action Plan up to 2020 to ensure that it is complying with the EU renewable target, with specific measures planned to that end. Under the Estonian Rural Development Plan 2014–2020, which affects both the agriculture and energy sector, the production of heat and electricity from biogas is supported, with planned investment in activities of EUR 18 million by 2020. The Party has a feed-in tariff system for RES- and efficient CHP-based electricity production. Under the system, renewable energy plants that do not exceed 100 MW are provided with EUR 0.0537/kWh.

49. **Energy efficiency**. Increasing energy efficiency is one of Estonia's key goals. Obligations to improve energy efficiency are derived from EU strategies and legislation (under the overall EU indicative target to improve energy efficiency by 20 per cent by 2020 compared with 1990). In 2011 the second National Energy Efficiency Action Plan was adopted, as discussed in the NC6 and previous review report[4]. Since then two new plans have been compiled, of which the latest was presented to the European Commission in May 2017. The improved energy efficiency and reduced energy intensity of the economy are also key in the updated National Reform Programme Estonia 2020, which foresees the implementation of long-term structural changes in the energy sector in accordance with Estonia's energy security and energy efficiency objectives (see para. 26 above).

50. Estonia aims to increase energy efficiency by implementing measures particularly in district heating, which has quite large potential for increasing energy efficiency, which will in turn result in lower GHG emissions. The goals for heat supply are set in EEDP 2030+, which are to use the full potential of CHP plants, promote the use of local fuels and reduce the share of imported fuel use in heat supply. It is expected that the share of the use of RES for heat supply will be more than 60 per cent, the share of imported fuel use less than 30 per cent and the use of primary energy less than 19 TWh/year by 2030.

51. **Residential and commercial sector**. Estonia has implemented and planned several measures to reduce emissions from the buildings sector. Key measures aiming to reduce emissions from the residential and commercial/institutional sector are focused on energy conservation through reconstruction of buildings. Estonia aims to reconstruct 10 per cent of existing public and commercial buildings (to at least energy efficiency class D), 10 per cent of existing private houses (to at least energy efficiency class E) and 15 per cent of existing

[4] See document FCCC/IDR.6/EST, paragraph 54.

apartment buildings (to at least energy efficiency class E) in a 20-year period. According to the NC7, between 2010 and 2013, a total of 540 public buildings were reconstructed at a total cost of EUR 165.6 million. Furthermore, in seven cities street lighting was replaced with efficient lighting systems. Additional reconstruction measures are in the planning stage, such as additional reconstruction of 20 per cent of existing public and commercial buildings (to at least energy efficiency class C), 40 per cent of existing private houses (to at least energy efficiency classes C and D) and 50 per cent of existing apartment buildings (to at least energy efficiency class C) in a 20-year period.

52. **Transport sector**. Reducing GHG emissions from the transport sector is one of the main goals for Estonia in meeting its targets under the ESD as the sector is growing in line with GDP. The Estonian Parliament approved the Transport Development Plan 2014–2020 in February 2014. The Party aims to decrease emissions from transport by decreasing the use of fuel-based vehicles, upgrading rail transport, increasing vehicles' use of RES and more efficient fuels and improving the traffic system. The targeted share of biofuel use for transport is 10 per cent by 2020.

53. The NC7 includes information on how Estonia promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels.

54. **Industrial sector**. The NC7 indicates that the second National Energy Efficiency Action Plan states that increasing energy efficiency in manufacturing industries is mainly ensured by increasing environmental awareness and measures that are related to the wider energy policy, such as opening up the electricity market, the renewable energy charge, fuel and electricity excise duties and reduced differences in excise duty rates. At the beginning of 2017 the Ministry of the Environment launched a measure for increasing industrial resource efficiency, primarily for small and medium-sized companies to make energy savings. The actions supported are raising awareness, educating experts, conducting audits and making investments. While currently investment support is provided to the five most important sectors (mining, food processing, wood, pulp and paper, and non-metallic mineral industries), a new study is planned with a view to opening up investment to other sectors of manufacturing industries. According to the Party's Energy Sector Organization Act, large companies are mandated to have regular energy audits.

(c) Policies and measures in other sectors

55. **Industrial processes**. IPPU emissions make a minor contribution to the total emissions of Estonia, namely 2.8 per cent in 2015 (512.92 kt CO_2 eq with indirect CO_2 and 497.04 kt CO_2 eq without indirect CO_2) (see table 4 and para. 18 above). In the NC6 Estonia reported that its Industrial Emissions Act from 2013 (based on EU directive 2010/75/EU) obliges manufacturing industries under the EU ETS to use best available technologies, have integrated environmental permits and report domestic emissions. According to the integrated environmental permits, all Estonian mineral and chemical production plants in the IPPU sector already use best available technologies and therefore this measure is considered to have no further effect.

56. The only measure relevant to the IPPU sector reported in the NC7 was linked to fluorinated gases. In January 2017, Estonia's Ambient Air Protection Act was repealed and replaced by the Atmospheric Air Protection Act, which covers all relevant legislation regarding fluorinated gases, including EU regulation 517/2014 on fluorinated GHGs. Its aim is the reduction of emissions of fluorinated gases and their replacement by other substances via bans on the use of fluorinated gases with high global warming potential and equipment using such gases.

57. **Agriculture**. Emissions from agriculture contributed 7.4 per cent (1,337.6 kt CO_2 eq) of total national GHG emissions in 2015. In the NC7 Estonia identified PaMs under the Estonia Rural Development Plan 2014–2020, which are also referred to in the Climate Change Mitigation and Adaptation Action Plan in the Agriculture Sector 2012–2020 and in the Estonian Organic Farming Development Plan 2014–2020, to limit and reduce GHG emissions from the agriculture sector. Estonia plans to support organic farming and environmentally friendly land management. The Party also plans to reduce GHG and

ammonia emissions by promoting the use of biomass, producing renewable energy, investing in livestock buildings (including manure storage) and increasing the technological capacity of agricultural enterprises. The ERT noted that the NC7 does not include information on the expected impact of the measures in the agriculture sector.

58. **LULUCF**. The LULUCF sector is the only possible sink of GHG emissions in Estonia and plays an important role in the national carbon cycle. In 2015 the LULUCF sector acted as a CO_2 sink of 2,359.2 kt CO_2 eq. Compared with 1990, CO_2 removals from the LULUCF sector have increased by 36.0 per cent and by 34.4 per cent compared with 2014. The main policy for forest management in Estonia is the Forest Act, which provides the legal framework for ensuring the protection and sustainable management of forests as an ecosystem. In addition, the Estonian Forestry Development Programme until 2020 is the official sustainable development strategy for the Estonian forest sector. It includes measures to ensure the productivity and viability of forest, support local varieties and enhance carbon sequestration. The programme comprises various measures, such as timely regeneration of forest, improving forest health condition and providing support for growing local plant varieties. Natura 2000 will help to preserve carbon stock including private forest land areas. The expected impact of the measures in the LULUCF sector is difficult to assess and was not reported by Estonia.

59. **Waste management**. In 2015 the waste sector contributed 1.8 per cent (326.08 kt CO_2 eq) of the total GHG emissions of Estonia, which is 11.8 per cent below the sectoral emission level in 1990 and 4.2 per cent below that in 2014. General waste-related requirements and rules are stipulated in Estonia's Waste Act, which requires all landfills to meet EU-established requirements. It includes the limit on the percentage of biodegradable waste deposited, which should not exceed 20 per cent of the total amount of deposited municipal waste by July 2020. The ERT noted that the amount of biodegradable waste in the total amount by weight of municipal waste deposited in landfills was 57 per cent in 2011 and had decreased to 48 per cent by 2014.

60. The Waste Act and the National Waste Management Plan for 2014–2020 aim to increase the proportion of waste materials such as paper, metal, plastic and glass reused and/or recycled to 50 per cent of the total weight of waste materials by 2020 so as to reduce the GHG emissions originating from the waste sector. The level of reuse and recycling of waste materials was 27 per cent in 2011, which had increased to 35 per cent by 2014. Additionally the National Waste Management Plan defines PaMs for the prevention and reduction of waste generated, reduction of environmental risks arising from waste, and the improvement of monitoring and supervision. The expected impact of the measures in the waste sector was not always reported.

(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol

61. As part of the supplementary information under the Kyoto Protocol, in the NC7 (section 4.3.11) Estonia reported brief information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties.

62. More detailed information on how Estonia strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the Party's 2017 annual inventory submission. The Party reported on the minimization of effects on international trade, on the removal of incentives and subsidies for environmentally unsound and unsafe fuels and technologies and on social, environmental and economic impacts on other Parties. The reporting included information on cooperation on the development of technologies. In the NIR Estonia reported on the decision to already introduce taxes on shale oil and natural gas and an excise duty on electricity, despite the fact that the EU directive (2003/96/EC) on the taxation of fuels and energy allowed the country to postpone their introduction. Estonia also reported on its contributions to the Eastern Europe Energy Efficiency and Environment Partnership Fund and to the

Neighbourhood Investment Facility Trust Fund, which support investment in energy efficiency and strengthening transport and energy infrastructure in Armenia, Georgia and the Republic of Moldova.

(e) Assessment of adherence to the reporting guidelines

63. The ERT assessed the information reported in the NC7 of Estonia and identified four issues relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 7.

Table 7

Findings on policies and measures, including those in accordance with Article 2 of the Kyoto Protocol, from the review of the seventh national communication of Estonia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 14 Issue type: completeness Assessment: encouragement	The ERT noted that the NC7 does not include information on PaMs that are innovative and/or effectively replicable by other Parties. During the review Estonia explained that it is participating in EU know-how sharing and a study on funding new cost-efficient PaMs is under way. The ERT encourages the Party to improve the completeness of its reporting by providing information on PaMs that are innovative and/or effectively replicable by other Parties in its next NC.
2	Reporting requirement[a] specified in paragraph 21 Issue type: completeness Assessment: encouragement	The ERT noted that the NC7 does not include information on how progress with PaMs to mitigate GHG emissions is monitored and evaluated over time and on the institutional arrangements implemented to that end. In response to a question raised during the review, the Party explained that the development plan prepared by the Ministry of the Environment reflects the general arrangements for monitoring and evaluating the implemented PaMs. In addition, every year the annual performance report on the implementation of the development plan of the Ministry of the Environment is submitted to the Ministry of Finance and thereafter also evaluated by the National Audit Office of Estonia. The ERT encourages Estonia to improve the completeness of its reporting by including in the next NC a description of the way in which progress with PaMs to mitigate GHG emissions is monitored and evaluated over time, including information on the institutional arrangements for monitoring.
3	Reporting requirement[a] specified in paragraph 23 Issue type: transparency Assessment: encouragement	The ERT noted that the description of each policy or measure reported in the NC should include, as appropriate, a quantitative estimate of impacts of individual policies and measures or collections of policies and measures. Estonia reported on the impact of individual mitigation measures in the energy, transport and IPPU sectors for 2020, 2025, 2030 and 2035. However the NC7 does not include information on the expected impact of individual measures in the agriculture and LULUCF sectors or of most of the measures in the waste sector. In the relevant tables for quantitative information, the notation key "NE" is used with the explanation that estimates of mitigation impact are not available due to lack of quantifiable activity data for the reported measures. During the review the Party confirmed the difficulty of estimating the impacts of those measures. Noting the provided information, the ERT encourages Estonia to improve the transparency of its reporting by providing information on the expected impact of each individual sectoral measure.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
4	Reporting requirement[b] specified in paragraph 36 Issue type: transparency Assessment: recommendation	In the NC7 Estonia referred only in brief to the issue of minimization of adverse impacts and did not report on specific approaches or policies to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. The NC7 does not include reference to the NIR where more detailed information is provided. In response to a question raised during the review, the Party provided additional information, including on supporting the International Renewable Energy Agency in promoting the use of renewable energy and supporting the Eastern Europe Energy Efficiency and Environment Partnership Fund with activities in Armenia, Georgia and the Republic of Moldova. The ERT recommends that the Party provide in its next NC more detailed information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties, for instance by including references to specific initiatives already undertaken at the bilateral or multilateral level as provided during the review.

Note: The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

[a] Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

[b] Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

64. Estonia reported updated projections for 2020, 2025, 2030 and 2035 relative to actual inventory data for 2014 under the WEM scenario. The WEM scenario reported by Estonia includes implemented and adopted PaMs. The ERT noted that the sectoral projection tables included in the NC7 do not include historical data for 1990, 1995, 2000, 2005 or 2010.

65. In addition to the WEM scenario, Estonia also reported a WAM scenario, which includes planned PaMs. Estonia provided definitions of its scenarios, explaining that its WEM scenario includes current PaMs in all sectors, while its WAM scenario includes a number of additional measures in the energy and transport sectors. The definitions of the scenarios correspond to those provided in the UNFCCC reporting guidelines on NCs.

66. The projections are presented on a sectoral basis, using to the extent possible the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively). The projections are also provided in an aggregated format for each sector as well as for a national total using global warming potential values from the IPCC Fourth Assessment Report.

67. Estonia did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides in its submission.

68. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals.

69. Estonia reported on factors and activities affecting emissions for each sector except for international bunker fuels.

(b) Methodology, assumptions and changes since the previous submission

70. The methodology used for the preparation of the projections is an updated version of that used for the preparation of the emission projections for the NC6 (see para. 76 below).

71. The Balmorel model for analysing the electricity and CHP sectors from an international perspective while minimizing the total costs of the system was used for the energy sector. It combines the bottom-up modelling approach with top-down economic analysis, projections and forecasts. Using the energy demand projected by the model, GHG emissions were calculated following the 2006 IPCC Guidelines. The LEAP[5] model was used to calculate the GHG emission projections for the transport sector. Fuel consumption data from EEDP 2030+ alongside expert judgment and emission factor data from the 2006 IPCC Guidelines and country-specific emission factors were used to estimate GHG emissions from the sector.

72. For the IPPU sector, top-down assessments and models were used only for the subcategories product uses as substitutes for ozone-depleting substances and urea-based catalysts for motor vehicles. For the others categories, bottom-up approaches, companies' own projections and expert judgment were combined and used. Projections for the agriculture sector were calculated using a bottom-up approach from the 2006 IPCC Guidelines. Projected values of agricultural output, fertilizer use, number of livestock and cultivated agricultural land area were based on expert judgment. Projections for the LULUCF sector were calculated using averages for the period 1990–2015 adjusted to the reference year. Projections for the waste sector for solid waste disposal were calculated using the bottom-up waste model from the 2006 IPCC Guidelines; while for wastewater treatment and discharge, human population projections and expert judgment were used.

73. Estonia reported supporting information further explaining changes to methodologies since the NC6. There have been several methodological developments since the projections reported in the NC6, mostly related to the energy and transport sectors. The LEAP model is now used only for the transport sector projections, the projections for the energy sector are based on EEDP 2030+ and the renewed sectoral development plans are used for the projections for all sectors.

74. In the NC7 Estonia provided information on the changes since the submission of its NC6 in the assumptions used in the preparation of the projection scenarios as well as a comparison of the projection results (NC7 table 5.15).

75. To prepare its projections, Estonia relied on the following key underlying assumptions: GDP growth rate, GDP in constant prices, EU ETS carbon price, international (wholesale) fuel import prices, final energy consumption by sector, number of livestock (cattle, sheep, poultry, swine), nitrogen input from application of synthetic fertilizer and municipal solid waste generation. These variables and assumptions were reported in the NC7 table 5.14. The assumptions were updated on the basis of the most recent economic developments and new national development plans known at the time of the preparation of the projections.

76. Estonia also provided information on sensitivity analyses. However, sensitivity analyses were not conducted for the key assumptions, such as GDP and population growth for most sectors. Only for the waste sector the analysis assessed the assumptions for GDP growth and population trends to compare the Party's projections with the projections based on the harmonized values given by the European Commission as recommended parameters for reporting on GHG projections in 2017. In the NC7 section on sensitivity, possible changes in the energy development of the country against the adopted EEDP 2030+ were

[5] Long-range Energy Alternatives Planning system.

analysed. It is envisaged that, instead of seven additional solid heat carrier technology shale oil production plants, only three will be built in the period 2015–2035 and that electricity not produced from oil shale gas will be imported. The sensitivity analysis for the IPPU sector was based on an alternative fluorinated gas phase-out scenario that is reported as possible but not probable. The results of the analyses are presented in the NC7 in graphics without any textual or numerical analysis.

(c) Results of projections

77. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 8 and the figure below.

Table 8
Summary of greenhouse gas emission projections for Estonia

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
Kyoto Protocol base year[b]	39 996.70	NA	–1.0
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)[c]	6 382.12	NA	NA
Quantified economy-wide emission reduction target under the Convention[d]	NA	NA	NA
Inventory data 1990[e]	40 402.74	1.0	NA
Inventory data 2015[e]	18 040.48		
WEM projections for 2020[f]	19 331.99	–51.4	–52.2
WAM projections for 2020[f]	18 759.23	–53.1	–53.6
WEM projections for 2030[f]	17 033.46	–57.4	–57.8
WAM projections for 2030[f]	15 197.73	–62.0	–62.4

Note: The projections are for GHG emissions without LULUCF.

[a] "Base year" in this column refers to the base year used for the targets under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/EST.

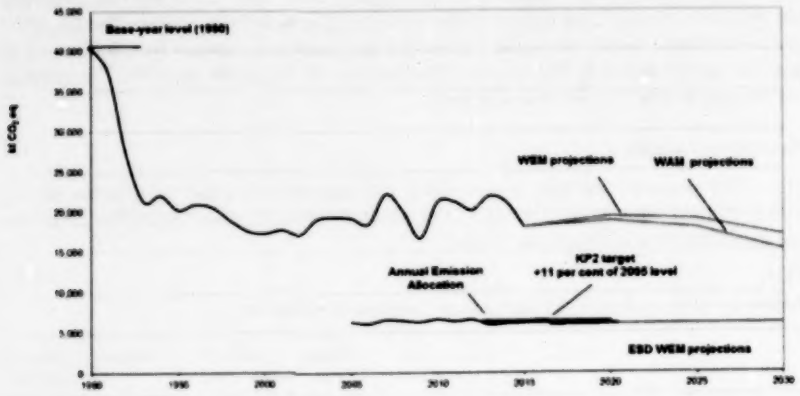
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target of the EU and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. The target for non-ETS sectors is 11.0 per cent for Estonia under the ESD. The value presented in this line is based on annex II to European Commission decision 2013/162/EU and as adjusted by Commission implementing decision 2013/634/EU that established the assigned amount for the EU member States and divided by eight years to calculate the annual emission level.

[d] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

[e] From Estonia's BR3 CTF table 6.

[f] From Estonia's NC7 and/or BR3.

Greenhouse gas emission projections reported by Estonia



Sources: (1) Data for the years 1990–2015: Estonia's 2017 annual inventory submission, version 3; total GHG emissions excluding LULUCF; (2) data for the years 2015–2030: Estonia's NC7; total GHG emissions excluding LULUCF; (3) data on historical emissions from non-ETS sectors for 2005–2014 and projected emissions from non-ETS sectors for 2015–2030 provided by the Party during the review.

78. Estonia's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 19,331.99 and 17,033.46 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 52.2 and 57.8 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 53.6 and 62.4 per cent and amount to around 18,759.23 and 15,197.73 kt CO_2 eq, respectively. The 2020 projections suggest that Estonia will continue contributing to the achievement of the EU target under the Convention.

79. Estonia's target for the non-ETS sectors is to limit its emission growth to 11 per cent above the 2005 level by 2020. Estonia's AEAs, which correspond to its national emission target for the non-ETS sectors, linearly increase from 6,296.99 kt CO_2 eq in 2013 to 6,369.96 kt CO_2 eq in 2016 and then decrease to 6,023.72 kt CO_2 eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 6,008.68 kt CO_2 eq by 2020. The projected level of emissions under the WEM scenario is below the AEAs for 2020. The ERT noted that this suggests that Estonia expects to meet its target under the WEM scenario.

80. Estonia presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Estonia presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Sector		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	33 920.20	14 248.40	13 919.63	11 606.97	10 905.62	–58.0	–59.0	–65.8	–67.8
Transport	2 477.19	2 359.29	2 115.30	2 626.03	1 491.65	–4.8	–14.6	6.0	–39.8
Industry/ industrial processes	965.73	1 005.01	1 005.01	972.47	972.47	4.1	4.1	0.7	0.7
Agriculture	2 669.72	1 468.13	1 468.13	1 623.55	1 623.55	–45.0	–45.0	–39.2	–39.2
LULUCF	–1 734.71	–2 139.81	–2 139.81	–1 703.67	–1 703.67	23.4	23.4	–1.8	–1.8

Waste	369.90	251.16	251.16	204.44	204.44	–32.1	–32.1	–44.7	–44.7
Other (specify)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total GHG emissions without LULUCF	**40 402.75**	**19 331.99**	**18 759.23**	**17 033.46**	**15 197.73**	**–52.2**	**–53.6**	**–57.8**	**–62.4**

Source: Estonia's BR3 CTF table 6.

81. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy (excluding transport) sector, amounting to projected reductions of 19,671.80 kt CO_2 eq (58.0 per cent), and in the agriculture sector, amounting to projected reductions of 1,201.59 kt CO_2 eq (45.0 per cent), between 1990 and 2020. The pattern of projected emissions reported for 2030 under the same scenario slightly changes owing to the further reduction of emissions in the energy sector and the slight increase of emissions in the agriculture sector after 2020. According to the projections reported for 2030 under the WEM scenario, the most significant emission reductions are expected to occur again in the energy (excluding transport) sector, amounting to projected reductions of 22,313.23 kt CO_2 eq (65.8 per cent), and in the agriculture sector, amounting to projected reductions of 1,046.17 kt CO_2 eq (39.2 per cent), between 1990 and 2020. The emission reductions in the period after 2020 in the energy sector are to be achieved by implementing emission reduction PaMs, while the agriculture sector emissions are expected to slightly increase owing to the projected increase in volume of agricultural production.

82. Projections under the WAM scenario are presented by sector for the energy and transport sectors and foresee reduced final consumption of energy owing to additional measures for energy efficiency and use of biofuels. Additional measures are not envisaged to be taken in the other sectors, for which only WEM scenarios are reported. The projected effect of the additional measures in the energy sector is an emission reduction of 328.77 kt CO_2 eq (2.3 per cent) in 2020 and 701.35 kt CO_2 eq (6.0 per cent) in 2030 and in the transport sector is 243.99 kt CO_2 eq (10.3 per cent) in 2020 and 1,134.38 kt CO_2 eq (43.2 per cent) in 2030 compared with the WEM scenario. The Party totals under the WAM scenario decrease by 572.76 kt CO_2 eq (3.0 per cent) for 2020 and 1,835.73 kt CO_2 eq (10.8 per cent) for 2030 compared with the WEM scenario.

83. Estonia did not present a 'without measures' scenario.

Table 10
Summary of greenhouse gas emission projections for Estonia presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Gas		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	37 069.22	17 078.06	16 531.67	14 737.45	12 969.66	–53.9	–55.4	–60.2	–65.0
CH_4	1 909.61	1 080.79	1 062.23	1 133.89	1 090.04	–43.4	–44.4	–40.6	–42.9
N_2O	1 423.92	975.94	968.13	1 050.77	1 026.68	–31.5	–32.0	–26.2	–27.9
HFCs	NO	194.70	194.70	108.72	108.72	–	–	–	–
PFCs	NO	NO	NO	NO	NO	–	–	–	–
SF_6	NO	2.50	2.50	2.63	2.63	–	–	–	–
NF_3	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	**40 402.75**	**19 331.99**	**18 759.23**	**17 033.46**	**15 197.73**	**–52.2**	**–53.6**	**–57.8**	**–62.4**

Source: Estonia's BR3 CTF table 6.

84. For 2020 the most significant reductions are projected for CO_2 emissions: 19,991.18 kt CO_2 eq (53.9 per cent) between 1990 and 2020, and 22,331.77 kt CO_2 eq (60.2 per cent) between 1990 and 2030. CH_4 emissions are expected to reduce by 828.82 kt CO_2 eq (43.4 per cent) between 1990 and 2020 and 775.72 kt CO_2 eq (40.6 per cent) between 1990 and 2030. N_2O emissions are expected to reduce by 447.98 kt CO_2 eq (31.5 per cent) between 1990 and 2020 and 373.15 kt CO_2 eq (26.2 per cent) between 1990 and 2030.

85. The projections under the WAM scenario presented by gas follow the same pattern as under the WEM scenario reported for 2020 and 2030.

86. The comparison of the results with the projections presented in the NC6 shows a significant increase in the projected emissions for 2020 (by 13.3 per cent for the WEM scenario and by 10.7 per cent for the WAM scenario). The reasons for the differences in the projected emissions between the submissions were not explained.

(d) Assessment of adherence to the reporting guidelines

87. The ERT assessed the information reported in the NC7 of Estonia and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 11.

Table 11
Findings on greenhouse gas emission projections reported in the seventh national communication of Estonia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 35 Issue type: completeness Assessment: encouragement	According to paragraph 35 of the UNFCCC reporting guidelines on NCs, Parties may provide projections of the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides. The ERT noted that Estonia did not report emission projections for indirect GHGs. During the review, Estonia explained that indirect emissions of carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides comprise a minor part of Estonia's GHG emissions and thus are not a priority in Estonia's improvement plans compared to major parts at this point of time. Noting the explanation provided during the review, the ERT encourages the Party to develop and report projections for indirect GHGs for the next NC.
2	Reporting requirement[a] specified in paragraph 42 Issue type: transparency Assessment: encouragement	The emission projections related to fuel sold to ships and aircraft engaged in international transport were reported correctly but the ERT noted that the Party did not provide sufficient information to allow the ERT to obtain a basic understanding of the approach used for these projections. Specifically, Estonia did not provide information on the applied methodology and the projected activity data. In response to a question from the ERT during the review, the Party explained the underlying assumptions and the approach used for developing the projections. The ERT encourages the Party to increase the transparency of its reporting by including in the next submission information on the approach used for making the projections of emissions from international bunkers, for example by discussing the main assumptions and methods used.
3	Reporting requirement[a] specified in paragraph 48 Issue type: transparency Assessment: recommendation	According to the UNFCCC reporting guidelines on NCs, Parties shall present relevant information on factors and activities for each sector to provide the reader with an understanding of emission trends in 1990–2020. The ERT noted that Estonia included information on projections and key factors and activities in the NC for the 1990–2030 period, but commented on the trends and drivers for the period 2015–2030 only and did not present information or comment on the period 1990–2014 in the sectoral information sections. During the review, Estonia explained that sectoral trends were presented in table 5.16 (chapter 5) of its NC7. The Party indicated that it will improve the description of trends and drivers for the entire period in the next NC, taking into account the extensive amount of information provided in the report and trying to keep the report's length within reasonable limits.

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		The ERT reiterates the recommendation made in the previous review report (FCCC/IDR.6/EST, para. 86) that Estonia improve the transparency of its reporting on projections by providing sectoral projection tables that include historical data for 1990, 1995, 2000, 2005 and 2010 and comment on the trends and drivers for the entire period 1990–2030.

Note: The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

[a] Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

88. In the NC7 Estonia did not present the estimated and expected total effect of implemented and adopted PaMs or an estimate of the total effect of its PaMs, in accordance with the WEM scenario, compared with a situation without such PaMs. In the section on the total effect of PaMs (section 5.3 of the NC), Estonia presented an estimate of the total effect of its PaMs as the difference between the WAM and WEM scenario. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis), in 2020, 2025, 2030 and 2035.

89. During the review Estonia provided additional information on the estimated aggregate effect of its PaMs in the energy, transport and waste sectors as a comparison with a situation without PaMs. The aggregate effects of PaMs for 2020, 2025 and 2030 were calculated as 22,427.23, 22,481.07 and 20,329.67 kt CO_2 eq, respectively.

90. Table 12 provides an overview of the total effect of PaMs as reported by Estonia.

Table 12
Projected effects of Estonia's planned, implemented and adopted policies and measures by 2020 and 2030

	2020		*2030*	
Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*
Energy (without transport)	NE	328.77	NE	701.35
Transport	NE	243.99	NE	1 134.38
Industrial processes	NE	–	NE	–
Agriculture	NE	–	NE	–
Land-use change and forestry	NE	–	NE	–
Waste management	NE	–	NE	–
Total	**22 497.23**	**572.76**	**20 329.67**	**1 835.73**

Source: Estonia's NC7 and answers to ERT questions.

Note: The total effect of implemented and adopted PaMs is defined as the difference between a "comparison scenario", specially developed by the Party to answer the ERT questions, and the WEM scenario; the total effect of planned PaMs is defined as the difference between the WEM and WAM scenario as reported in the CTF tables.

(b) Assessment of adherence to the reporting guidelines

91. The ERT assessed the information reported in the NC7 of Estonia and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 13.

Table 13
Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Estonia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 39 Issue type: completeness Assessment: recommendation	The ERT noted that in the projections section of the NC7 Estonia did not present the estimated and expected total effect of implemented and adopted PaMs. In response to a question from the ERT, the Party explained that estimates of mitigation effect are not currently available for all sectors or for all PaMs. The Party is looking into how to facilitate the estimation of mitigation effects. The ERT recommends that in the next NC Estonia present the estimated and expected total effect of implemented and adopted PaMs, together with a description of the approach used, in order to improve the completeness of its reporting.
2	Reporting requirement specified in paragraph 40 Issue type: completeness Assessment: recommendation	The ERT noted that in the projections section of the NC6 Estonia did not provide an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs. The issue was included in the previous review report (see document FCCC/IDR.6/EST, para. 102). In response to a question from the ERT, the Party explained that it has not compiled a national 'without measures' scenario for such comparison. Also, estimates of the mitigation effect are not currently available for all sectors or for all PaMs for estimating the total effect of the PaMs. During the review the Party provided to the ERT additional information on the estimated aggregate effect of its PaMs in the energy, transport and waste sectors. The Party explained that the estimate was prepared by establishing a 'comparison scenario' that projects what would have been the situation if Estonia had not implemented its current PaMs. The ERT recommends that Estonia improve the completeness of its reporting on projections by including in its next NC an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs, presenting the effect in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis).

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

92. In the NC7 Estonia provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The ERT noted that Estonia expects to fulfil its 2020 target with surplus and therefore does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

93. During the first commitment period of the Kyoto Protocol, Estonia used two of the three flexible mechanisms, joint implementation and international emissions trading, through six agreements with different European governments and 15 agreements with different Japanese companies. The resulting proceeds were used to support the projects or programmes of the Green Investment Scheme. In the NC7 (chapter 4) Estonia stated that the CDM had not been used by Estonia at the national level. No reference was made to the use of certified emission reductions by companies participating in the EU ETS. However, during the review, Estonia explained that companies subject to the EU ETS have used international credits from the CDM to contribute to meeting their emission reduction obligations.

(b) Assessment of adherence to the reporting guidelines

94. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

95. Estonia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Estonia provided information in the NC7 on its provision of support to developing country Parties. The ERT commends Estonia for reporting this information and suggests that it continue to do so in future NCs, if such information is available.

96. Estonia pledged to contribute EUR 1 million annually until 2020 for financing international climate cooperation by supporting environmentally sustainable development in developing countries by contributing to bilateral projects, multilateral organizations and regional funds. Estonia has decided to channel EUR 5 million from the revenues from the auctioning of EU ETS allowances to international climate cooperation and 100 per cent of the revenues from EU ETS aviation auctions to funding innovative climate projects and start-ups in 2015–2020. To date, funding from the private sector has been mobilized for domestic climate-related activities rather than for climate cooperation. In future Estonia is planning to involve the private sector in financing climate cooperation in developing countries. Estonia has been and will be supporting developing countries in the fight against climate change via bi- and multilateral channels under bi- and multilateral agreements.

97. Estonia provided quantitative information on financial support allocated in 2013–2016 through multilateral and bilateral channels towards mitigation, adaptation and cross-cutting activities (reported in euros without converting the amounts into United States dollars) in table 7.1 of the NC7. The total climate-specific financial contributions provided by Estonia through multilateral channels in 2015 and 2016 were EUR 1,205,525 and 384,099, respectively, mainly via multilateral climate change funds. Most of the support was channelled through official development assistance in accordance with the methodology of the Development Assistance Committee of the Organisation for Economic Co-operation and Development.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

98. In the NC7 Estonia provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Estonia provided a description of climate change vulnerability and impacts on eight sectors or areas most vulnerable to climate change, including health and rescue capability, bioeconomy, natural environment, and energy and security of supply, and highlighted the adaptation response actions taken and planned at different levels of government.

99. The overview of climate change in Estonia in the last century and the projections of future climate change in the country are based on the ESTEA overview report compiled in 2014 on future climate change scenarios in Estonia until 2100.[6] The ERT noted that, in line

[6] Estonian Environment Agency. 2014. Eesti tuleviku kliimastsenaariumid aastani 2100 (Future climate change scenarios in Estonia until 2100). Available at https://www.envir.ee/sites/default/files/kliimastsenaariumid_kaur_aruanne_ver190815.pdf.

with the encouragement in the previous review report,[7] Estonia provided information on the climate models and various approaches and methodologies used for its vulnerability assessment. A thorough assessment of the sectors influenced by the atmospheric conditions formed the basis for drafting the national development plan for adaptation to the impacts of climate change.

100. Impetus has been given to addressing adaptation matters with the adoption of Estonia's Climate Change Adaptation Development Plan until 2030 in March 2017, which provided further direction to government agencies on enhancing preparedness for climate change. The general goal of the plan is to decrease the vulnerability of Estonia to climate change and achieve the preparedness and capability to cope with the impacts of climate change at the local, regional and national level with the help of a framework of direct and indirect measures. The NC7 reported on the coverage of adaptation to climate change in legislative acts dealing with emergency situations (e.g. the Emergency Act and the Water Act).

101. Table 14 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Estonia.

Table 14
Summary of information on vulnerability and adaptation to climate change reported by Estonia

Vulnerable area	*Examples comments adaptation measures reported*
Health and rescue capability	*Vulnerability*: Spread of new pathogens and increase in health disorders. *Adaptation*: Developing information, monitoring and support systems and drawing up action plans to increase the efficiency of the management of health risks; increasing rescue capability.
Land use and planning	*Vulnerability*: Increased flood risk and pressure to relocate buildings. *Adaptation*: Increasing awareness of the impacts and risks of climate change and adjusting the legal framework; managing the flood hazard and developing green areas and green areas in cities to manage climate risks.
Natural environment	*Vulnerability*: Changes in hydrological cycle and vegetation and the spread of alien species. *Adaptation*: Preserving biodiversity in changing weather conditions; preventing the entry of invasive foreign species into nature and eradicating and controlling such species; ensuring the favourable condition of biotas and the variety of landscapes, and organizing nature conservation; ensuring the stability, favourable conditions, functions, resources and variety of terrestrial ecosystems and habitats; monitoring the condition of surface water, the structure of the composition of biota, the external and internal loads of substances arising from changes in temperature and the hydrologic regime and minimizing climate risks; ensuring the sufficient extent and quality of ecosystem services.
Bioeconomy	*Vulnerability*: Unfrozen and waterlogged forest land in winter and new plant pests. *Adaptation*: Ensuring food supply through development of land improvement systems, increasing agricultural competitiveness and transfer of knowledge; ensuring the productivity and viability of forests and the diverse and efficient use of forests; ensuring the sustainability of fisheries resources and the welfare of the beneficiaries; diversifying tourism and increasing the satisfaction of visitors.
Economy	*Vulnerability*: Transient effects of global trends on the economy. *Adaptation*: Managing household risks; supporting entrepreneurship that takes the impacts of climate change into consideration.

[7] FCCC/IDR.6/EST, paragraph 110.

Vulnerable area	*Examples/comments/adaptation measures reported*
Society, awareness and cooperation	*Vulnerability*: Immigration due to global migration. *Adaptation*: Increasing the efficiency of risk management; supporting the adaptation to climate change of education institutions at all levels; ensuring the availability of up-to-date and thorough information about the impacts of climate change; participating in international cooperation for the development of a strong international climate policy.
Infrastructure and buildings	*Vulnerability*: Interruptions to traffic; vulnerability of transport technologies, fuels and building stock to extreme weather phenomena. *Adaptation*: Ensuring safe traffic, delivery of goods and access to vital services; ensuring the durability and energy efficiency of buildings and a comfortable indoor climate for people in changing weather conditions.
Energy and security of supply	*Vulnerability*: Changes in seasonal energy consumption. *Adaptation*: Ensuring the availability of RES and energy and heating supply to consumers in changing climate conditions.

102. Although not specifically covered in the chapter on vulnerability and adaptation, Estonia provided detailed information on its provision of support to international adaptation activities in its NC7 in the chapter on financial resources and transfer of technology. In particular, the Party reported on the project "Implementing the Climate Change Adaptation Component of the Satellite Communications Capacity and the Emergency Communications Solutions Project for the Small Island Developing States of the Pacific" carried out in cooperation with the International Telecommunication Union (to which Estonia made a contribution of EUR 100,000) as well as on the project "Strengthening Climate Change Adaptation in Rural Communities, for Agriculture and Environmental Management in Afghanistan" (to which Estonia made a contribution of EUR 1,605,008). The projects entailed building national capacity in planning community resilience to threats related to climate change and providing services related to disaster management. The ERT noted that providing a cross reference to this information in the chapter on vulnerability and adaptation would improve the transparency of the reporting in the NC.

2. Assessment of adherence to the reporting guidelines

103. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

F. Research and systematic observation

1. Technical assessment of the reported information

104. Estonia provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme, the Global Climate Observing System and the Global Precipitation Climatology Centre. Estonia also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

105. Estonia has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. The basis for the organization of research is the Organization of Research and Development Act. The Ministry of Education and Research is responsible for the planning, coordination, execution and monitoring of education and research policies. With the adoption of the National Reform Programme Estonia 2020, the funding of research and development activities is planned to increase to 3 per cent of GDP by 2020. Such growth should mainly be supported by the private sector's increased financing of development activities.

106. According to the NC7, Estonian researchers study different aspects of climate, such as climate processes, the climate system, paleoclimates, impacts of climate change, mitigation and adaptation technologies. They have been involved in modelling and predicting different future climate-related aspects. Research is also carried out with a view to performing different parts of the national environmental monitoring programme (e.g. meteorological and hydrological monitoring, soil monitoring) and improving the national GHG inventory for different sectors. Thus, in 2016, ESTEA started the project "Greenhouse gas emissions inventory research for national reporting in the fields of litter and forest soil", funded by the Environmental Investment Centre; and in 2017 the Institute of Physics of the University of Tartu (the Laboratory of Atmospheric Physics) started researching on the cooling effect of wind on high-voltage power lines to optimize the capacity of power lines in a situation where new wind turbines are continuously being built in western Estonia. In 2014 the Ministry of the Environment concluded an agreement with the Estonian University of Life Sciences on developing a method for estimating average GHG emissions from the production of crops grown for manufacturing biofuels. The aim of the project was to calculate the average level of the emissions produced when raising different crops (rape, rye, wheat, barley and triticale) per Estonian county.

107. In terms of activities related to systematic observation, Estonia reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Estonia also reported on challenges related to the maintenance of a consistent and comprehensive observation system. The main goal of the environmental monitoring by ESTEA is to forecast (through continuous monitoring and evaluation of environmental factors and environmental status) changes in environmental factors and statuses via a developed indicator system and forecasting models.

108. According to the NC7, Estonia contributes to international cooperation on systematic observation as a member of the international Group on Earth Observations and by supporting the creation of the Global Earth Observation System of Systems for ensuring the sustainable development of humankind. The ESTEA weather service fulfils the obligations of the Estonian national meteorological service in accordance with its statutes and the recommendations of the World Meteorological Organization and participates in the latter's climate programme, including the Global Climate Observing System. It takes part in the work of many other international organizations.

109. The NC7 reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Estonia has provided funding for scientists from developing countries working on global climate change research. The information was provided in the NC7 chapter on financial resources and transfer of technology.

2. Assessment of adherence to the reporting guidelines

110. The ERT assessed the information reported in the NC7 of Estonia and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. Education, training and public awareness

1. Technical assessment of the reported information

111. In the NC7 Estonia provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness, public information campaigns, resource or information centres, the involvement of the public and non-governmental organizations and its participation in international activities.

112. The NC7 reported that the Estonian education system supports teaching on sustainable development. Environmental education in Estonia is promoted by the cooperation between the Ministry of Education and Research and the Ministry of the

Environment. In 2017, the heads of the two ministries signed the third joint action memorandum, which sets the direction for future cooperation to promote education for sustainable development. Even the national curriculum of preschool institutions includes a field "the environment and I". The national curriculum for primary schools and upper secondary schools includes the compulsory recurrent topic of environment and sustainable development. The topic of climate is rare on the curricula of vocational educational institutions or institutions of applied higher education. At the level of higher education, there are various climate and climate change related courses.

113. The Ministry of Education and Research in Estonia supports the participation of school children in various extracurricular environmental programmes and environmental research work competitions as well as various environmental education projects for school children by targeted financing. In addition to formal education, several organizations all over Estonia are providing informal education on nature and the environment. The NC also indicates several barriers to the successful implementation of formal and informal climate change education.

114. The NC7 indicates that the public awareness of Estonians about climate change is increasing gradually (40 per cent of the population were believed to be well aware of the impacts of climate change in 2016), although the Estonians are not as involved in climate change discussions as other EU citizens. Cited surveys show awareness of the importance of shifting to renewable energy. The NC7 lists several public information campaigns, mainly focused on energy efficiency and healthy mobility. Media initiatives have increased in connection with the Paris Agreement. Lots of climate change related information is publicly available online, such as via the websites of the Ministry of the Environment and the Environmental Research Centre [8] or of other organizations and non-governmental organizations.[9]

115. Estonia participates actively in international clean-up actions. The Let's Do It Foundation developed information technology solutions for mapping illegal dump sites. The Foundation was awarded the European Citizen's Prize by the European Parliament in 2017. The running of Tallinn for the title of the European Green Capital of 2018 and 2019 provides additional impetus for the sustainable development of the city.

2. Assessment of adherence to the reporting guidelines

116. The ERT assessed the information reported in the NC7 of Estonia and identified an issue relating to completeness. The finding is described in table 15.

Table 15
Finding on education, training and public awareness from the review of the seventh national communication of Estonia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 65 Issue type: completeness Assessment: encouragement	The ERT noted that Estonia did not include information on the extent of public participation in the preparation or domestic review of the NC. In response to a question raised during the review, the Party explained the involvement of various governmental and non-governmental organizations in the preparation of the NC and in the final confirmation of its content. The ERT encourages the Party to improve the completeness of its reporting by including in its next NC information on the extent of public participation in the preparation or domestic review of the NC.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

[8] http://www.envir.ee/et/kliima%20and%20http://www.klab.ee/kohanemine/.
[9] http://www.kliimamuutused.ee/; https://www.maailmakool.ee/.

III. Conclusions and recommendations

117. The ERT conducted a technical review of the information reported in the NC7 of Estonia in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC7 provides an overview of the national climate policy of Estonia.

118. The information provided in the NC7 includes most of the elements of the supplementary information under Article 7 of the Kyoto Protocol, with the minor exception of some aspects of the information on PaMs in accordance with Article 2 of the Kyoto Protocol and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures, which were provided during the review. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Estonia in its 2017 annual submission.

119. Estonia's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 55.3 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 59.4 per cent below its 1990 level in 2015. Emission decreases were driven mainly by the restructuring of the economy due to the transition from a centrally planned to a market economy. The decrease in GHG emissions between 1990 and 2000 is related to major structural changes in the economy after Estonia gained its independence from the former Soviet Union. After 2000, fluctuations in emissions are due mainly to economic trends, changes in the energy supply structure, variations in electricity production level and weather conditions.

120. Estonia's main policy framework relating to energy and climate change is derived from the EU climate policy. The low-carbon strategy GPCP 2050, adopted in 2017, aims at long-term emission reduction with a target of 80 per cent emission reduction by 2050 compared with 1990. Key legislation supporting Estonia's climate change goals includes various documents, such as the National Reform Programme Estonia 2020 (envisaging that emissions from non-ETS sectors should not exceed the level of 11 per cent growth by 2020 compared with the 2005 level, a 25 per cent share of renewables in final energy consumption by 2020 and keeping energy consumption at the 2010 level (118 PJ)) and the Sustainable Development Act. The expected outcomes of EEDP 2030+ are GHG emission reduction by 70 per cent in the energy sector, the share of renewable energy increased to 50 per cent of final energy consumption, and final energy consumption in 2020 and 2030 kept at the same level as in 2010. The actions with the most significant mitigation impact are supporting RES, efficiency improvements in the use of oil shale and efficient CHP-based electricity production, increasing the share of biofuel use for transport, and renovation of boiler houses and heat networks.

121. GHG emission projections were provided by Estonia under the WEM and WAM scenarios. Under the two scenarios, emissions are projected to be 52.2 and 53.6 per cent below the 1990 level by 2020, respectively. On the basis of the reported information, the ERT concludes that Estonia expects to meet its 2020 emission reduction target under the WEM and WAM scenarios.

122. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Estonia committed to contributing to the joint EU economy-wide quantified emission reduction target to reduce GHG emissions by 20 per cent compared with the base-year level by 2020. The projections indicate that Estonia can meet its Kyoto Protocol target for the second commitment period even under the baseline scenario and that its GHG emissions are not expected to exceed the Kyoto Protocol target by 2020.

123. According to EU decision 406/2009/EC, Estonia's national target for 2020 for the non-ETS sectors is to limit emission growth to 11 per cent above the 2005 level (a positive limit). Estonia's AEAs, which correspond to its national emission target for the non-ETS sectors, equal 6,023.72 kt CO_2 eq for 2020. The projected level of emissions under the WEM scenario is below the AEAs for 2020. On the basis of the reported information, the ERT concludes that Estonia expects to meet its target for the non-ETS sectors.

124. The ERT noted that Estonia is on track to achieving the national targets set out in the National Reform Programme Estonia 2020, as the Party had already reached its 2020 targets by 2015 with a renewable energy share of 28.6 per cent, non-ETS sector emissions below the 2005 level and final energy consumption in 2015 (116 PJ) at the 2010 level (118 PJ).

125. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such, since Estonia expects to exceed its 2020 target and therefore does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

126. Estonia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Estonia provided information in its NC7 on its provision of support to developing country Parties. Estonia continued to provide climate financing to developing countries in line with its climate finance programmes by channelling EUR 5 million from the revenues from the auctioning of EU ETS allowances to international climate cooperation and 100 per cent of the revenues from EU ETS aviation auctions to funding innovative climate projects and start-ups.

127. Estonia in its NC7 described climate change impacts, vulnerability and adaptation actions, focusing mainly on the impacts of climate change, the sectors vulnerable to climate change and providing general information on actions being implemented to adapt to climate change. Estonia indicated that the key sectors vulnerable to climate change are health and rescue capability, land use and planning, natural environment, the bioeconomy and the economy. Estonia provided in the NC7 information on its cooperative actions with other countries on adaptation.

128. Estonia provided information on research and systematic observation activities and programmes at both the domestic and international level. Estonia is strengthening its scientific institutions and increasing funding for research.

129. In its NC7 Estonia provided comprehensive information on its education, training and public awareness activities.

130. In the course of the review, the ERT formulated the following recommendations for Estonia to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:[10]

(a) To improve the completeness of its reporting by:

(i) Including in its next submission the information provided during the review concerning any national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, also contributes to the conservation of biodiversity and sustainable use of natural resources (issue 1, table 5);

(ii) Presenting the estimated and expected total effect of implemented and adopted PaMs, together with a description of the approach used (issue 1, table 13);

(iii) Including an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs, presenting the effect in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis) (issue 2, table 13);

(b) To improve the transparency of its reporting by:

(i) Providing more detailed information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and

[10] The recommendations are given in full in the relevant sections of this report.

social, environmental and economic impacts on other Parties, especially developing country Parties, for instance by including references to specific initiatives already undertaken at the bilateral or multilateral level (issue 4, table 7);

(ii) Providing historical data since 1990 in the sectoral projection tables and commenting on the trends and drivers for the entire period 1990–2030 (issue 3, table 11).

IV. Questions of implementation

131. During the review the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Estonia. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

BR3 of Estonia. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/9367451_estonia-br3-1-br3_est_29122017.pdf.

BR3 CTF tables of Estonia. Available at http://unfccc.int/national_reports/biennial_reports_and_iar/biennial_reports_data_interface/items/10132.php.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at http://unfccc.int/resource/docs/cop5/07.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex to decision 15/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex III to decision 3/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

"Guidelines for review under Article 8 of the Kyoto Protocol". Annex to decision 22/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf.

NC7 of Estonia. Available at http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/37608415_estonia-nc7-1-nc7_est_30122017.pdf.

Report on the individual review of the annual submission of Estonia submitted in 2016. FCCC/ARR/2016/EST. Available at http://unfccc.int/resource/docs/2017/arr/est.pdf.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Estonia. FCCC/IRR/2016/EST. Available at http://unfccc.int/resource/docs/2017/irr/est.pdf.

Report on the technical review of the sixth national communication of Estonia. FCCC/IDR.6/EST. Available at http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600008402#beg.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Cris-Tiina Türkson (Estonian Environmental Research Centre), including additional material. The following documents[1] were provided by Estonia:

Ministry of Environment. 2017. Low-carbon strategy General Principles of Climate Policy until 2050. Available at http://www.envir.ee/sites/default/files/low_carbon_strategy_until_2050.pdf.

[1] Reproduced as received from the Party.